

WHAT IS CLAIMED IS:

1. A multiple antenna system, comprising:
- (a) first and second antennas;
 - (b) first and second signal circuits connected with respective first
5 and second antennas via first and second signal paths;
 - (c) a first parallel tuning circuit selectively connectable in parallel with the first signal path, the first tuning circuit selectively adjusting the impedance of the first antenna.
2. The multiple antenna system of claim 1 further comprising a third
10 antenna connected with a third signal source via a third signal path.
3. The multiple antenna system of claim 1, wherein the first and second signal circuits are capable of generating electromagnetic signals.
4. The multiple antenna system of claim 3, wherein the electromagnetic signals include radio frequency signals.
- 15 5. The multiple antenna system of claim 1, wherein the first and second signal circuits generate signals at unique frequencies.
6. The multiple antenna system of claim 1, wherein the first and second signal circuits generate signals at the same frequencies.
- 20 7. The multiple antenna system of claim 1, wherein the first and second antennas are fabricated on a common dielectric material.
8. The multiple antenna system of claim 1, further comprising an antenna housing capable of housing at least the first and second antennas.
9. The multiple antenna system of claim 1, wherein the second signal circuit is capable of generating signals in multiple frequency bands.

Sub a1 }
10. The multiple antenna system of claim 9, wherein the first parallel tuning circuit is capable of increasing isolation between the first and second antennas in multiple frequency bands.

Sub C1 }
5 11. The multiple antenna system of claim 1, wherein the first parallel tuning circuit includes an impedance matching circuit.

Sub a2 }
12. The multiple antenna system of claim 11, wherein the impedance matching circuit is capable of matching an impedance of the second antenna via electromagnetic coupling with the first antenna.

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10 13. The multiple antenna system of claim 11, wherein the impedance matching circuit is capable of matching an impedance of the second antenna.

Sub C1 }
14. The multiple antenna system of claim 11, wherein the first tuning circuit includes a plurality of impedance matching circuits, each impedance matching circuit being independently selectively connectable in parallel to the first signal path.

Sub a3 }
15 15. The multiple antenna system of claim 1 further comprising:
(d) a second parallel tuning circuit selectively connectable to the second signal path.

20 16. The multiple antenna system of claim 15, wherein the second parallel tuning circuit is capable of optimizing isolation between the first and second antenna.

Sub C1 }
17. The multiple antenna system of claim 1, wherein the first tuning circuit is selectively connectable to the first signal path near the first antenna.

25 18. The multiple antenna system of claim 1, wherein the first tuning circuit creates an impedance at an input of the first antenna substantially equivalent to an open circuit at the transmission frequency of the second antenna.

Sub C1
19. The multiple antenna system of claim 1, wherein the first parallel tuning circuit includes a plurality of band tuning circuits, each band tuning circuit being independently selectively connectable with the first signal path.

Sub A4
5 20. The multiple antenna system of claim 19, wherein each band tuning circuit creates a different impedance at an input to the first antenna.

21. The multiple antenna system of claim 19, wherein the first tuning circuit includes a first band tuning circuit capable of tuning the second antenna and a second band tuning circuit capable of tuning a third antenna.

22. The multiple antenna system of claim 19, wherein the first parallel tuning circuit is capable of dynamically adjusting the impedance.

23. The multiple antenna system of claim 19, further comprising a detector capable of dynamically connecting one or more of the plurality of band tuning circuits with the first signal path.

Sub C1 15
24. The multiple antenna system of claim 1, wherein the first signal source includes a radio transceiver.

25. The multiple antenna system of claim 1, wherein the multiple antenna system is adaptable for use in a cellular telephone.

Sub A4
20 26. A parallel tuning circuit for use in a multiple antenna system, comprising:

(a) a first impedance matching circuit; and
(b) a first switch capable of selectively connecting in parallel the first impedance matching circuits with a first antenna.

27. The parallel tuning circuit of claim 26, further comprising

(c) a second impedance matching circuit; and
25 (d) a second switch capable of selectively connecting in parallel the second impedance matching circuits with a second antenna.

28. The parallel tuning circuit of claim 26, wherein the first impedance matching circuit is capable of matching an impedance of a second antenna.

29. The parallel tuning circuit of claim 26, wherein the first impedance matching circuit is capable of matching an impedance in multiple frequency bands.

30. The parallel tuning circuit of claim 26, wherein the first impedance matching circuit includes a selectable impedance.

31. The parallel tuning circuit of claim 30, wherein the selectable impedance is digitally selectable.

32. The parallel tuning circuit of claim 30, wherein first impedance matching circuit dynamically adjusts impedance based on external interference.

33. A method of adjusting impedance in a multiple antenna system, comprising:

- (a) detecting a first operational state of a first signal source connected with a first antenna via a first signal path;
- (b) detecting a second operational state of a second signal source, the second signal source being connected with a second antenna via a second signal path, the second antenna being located near the first antenna;
- and
- (c) selectively connecting a parallel impedance circuit with the first signal path based on the first and second operational states.

34. The method of claim 33, further comprising:

- (d) measuring external interference near the first antenna; and
- (e) automatically adjusting the parallel impedance circuit based on the external interference.

35. The method of claim 33, wherein (b) includes detecting an operational state of a third signal source, the third signal source being connected with a third antenna via a third signal path, the third antenna being located near the first antenna and (c) includes connecting a parallel impedance circuit with the first signal path based on the first, second, and third operational states.

36. The method of claim 33, wherein (c) includes selectively attaching one of a plurality of parallel impedance circuits with the first signal path.

37. The method of claim 33, further including (d) selectively attaching a
10 second parallel impedance circuit with the second signal path.

38. The method of claim 33, wherein (c) includes selecting a desired parallel impedance, selecting from a plurality of parallel impedance circuits a parallel impedance circuit that most closely matches the desired parallel impedance, and attaching the selected parallel impedance circuit with the first signal path.

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